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Age of Initiating Smoking: An Independent Predictor of Chronic Obstructive Pulmonary Disease in Later Life

The article "Childhood Cigarette Smoking and Risk of Chronic Obstructive Pulmonary Disease in Older U.S. Adults" by Sargent and colleagues (pp. 428–434) in this issue of the *Journal* (1), based on data available on 22,374 adults ⩾40 years of age from the 2020 NHIS (National Health Interview Survey) (2), emphasizes the important influence of the age of starting regular tobacco cigarette smoking during adolescence on the subsequent development of chronic obstructive pulmonary disease (COPD) in adults ⩾40 years of age. In a multivariable analysis that was adjusted for influential covariates, age of smoking initiation up to 20 years of age, particularly less than 15 years, was associated with a significantly greater prevalence of COPD compared with initiation at any age greater than 20 years. Moreover, initiation of smoking at <15 years, compared with older ages, was associated with a substantially greater likelihood of developing COPD in older life (prevalence 23.1% vs. 11.6%, respectively) that was independent of the cumulative lifetime amount of smoking. Another interesting finding was the intersection of poverty with childhood smoking; those in the poorest socioeconomic category were most likely to initiate smoking during adolescence.

Other findings of interest were that childhood smokers who subsequently developed COPD, compared with subjects with COPD who initiated smoking at older ages, accumulated more pack-years of smoking and were more likely to be current smokers, among whom smoking intensity was higher. A possible implication of the latter findings is that childhood smokers might be more likely to have a greater severity of COPD and a higher mortality rate, although these possible outcomes could not be tested using the data available from the NHIS, a problem not uncommon when relying on population-based survey data.

The authors raise a clinically important implication of their study, namely, the likelihood that initiation of smoking in childhood, during the time of continuing lung development, might disrupt this developmental process, leading to failure to reach a peak increase in FEV_1 that is recognized as one of the pathways to the development of COPD (3), suggesting the importance of further studies to explore this issue, such as high-resolution computed tomography scans with measurement of dysanapsis (4).

Several previous authors have reported that the initiation of smoking in childhood influenced the risk of developing COPD (5, 6) or moderate COPD (7) in older adulthood or of increased tobacco-related mortality due to multiple causes, including both cancer and COPD (8, 9). However, these earlier studies were limited by restricting the analysis to a single sex and failure to adjust for some relevant smoking-related measures, such as lifetime smoking, current smoking status, and current smoking intensity, that were creditably adjusted for in the present study (1); the latter's more rigorous analysis provides more confidence in its findings.

The authors acknowledge the many limitations of their study, which are mostly related to the circumscribed amount of data available from population-based survey studies, including *1*) the lack of spirometry-confirmed diagnosis of COPD; *2*) recall bias, particularly regarding the age of initiation of regular smoking on the basis of the likely imprecise memory decades after events that occurred during childhood; *3*) uncertainty regarding the meaning of "regular smoking"; and *4*) the lack of information on secondhand smoke exposure during childhood, prenatal exposure to maternal smoking, and childhood infections. Nonetheless, the many strengths of this study outweigh these limitations, which are common to population-based survey data in general, and the findings provide strong evidence supporting continuing rigorous efforts by public health and other governmental agencies and professional societies to prevent or discourage childhood smoking.

On the other hand, although the aforementioned governmental and private efforts have been successful in achieving a marked reduction in childhood smoking, the unfortunate truth is that, as shown in wave 6 of the PATH (Population Assessment of Tobacco and Health) study

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(10), a dramatic surge in adolescent nicotine vaping has occurred in parallel with the equally dramatic decline in childhood cigarette smoking (11). Although the independent long-term impact of electronic cigarette use on health outcomes, including COPD incidence and severity, is as yet unknown, the possibility of both acute and chronic harms to the lung health of adolescents, as well as older, vapers needs to be taken seriously and requires dedicated investigation. Consequently, equally strenuous efforts are needed at this time to deter children and adolescents from vaping as those previously and continually implemented to prevent and discourage childhood cigarette smoking. ■

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Addressing the Use of the CAPTURE (a Chronic Obstructive Pulmonary Disease Screening Tool) in Chronic Obstructive Pulmonary Disease Treatment Decisions

In this issue of the *Journal*, Li and colleagues (pp. 435–441) use the CAPTURE (COPD Assessment in Primary Care to Identify Undiagnosed Respiratory Disease and Exacerbation Risk) tool (five questions and peak expiratory flow) for stratifying a chronic obstructive pulmonary disease (COPD) population into those requiring treatment and those who could be "denied treatment" (1). This is a major shift from the screening of undiagnosed clinically significant COPD in primary care, for which CAPTURE was designed (2, 3). In clinical research and practice, trying to repurpose or expand uses for existing tools can have advantages over developing new ones. However, the new purpose must be clearly stated with consideration of how it might be used (or misused) in practice.

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The analyses of Li and colleagues leverage the COMPASS study (Investigation of the Clinical, Radiological and Biological Factors, Humanistic and Healthcare Utilisation Burden Associated with Disease Progression, Phenotypes and Endotypes of COPD in China) population (4) to consider how the CAPTURE tool might be used to identify participants with COPD with high symptom burden, and, in their discussion, they suggest "that use of CAPTURE in a routine practice setting will incur a low to very low risk of missing a patient who requires treatment." Their study population includes 85% with and 15% without spirometry-confirmed COPD (9% with chronic bronchitis and 6% healthy never smokers). The sensitivity and specificity for identifying those with a high symptom score are presented (separately for COPD Assessment Test [5] [CAT] score ⩾10, modified Medical Research Council dyspnea scale [6] [mMRC] score ⩾2, one or more moderate and one or more severe exacerbations [7] in the previous year).

It is important to emphasize the difference between this study and the recently published studies of the CAPTURE tool in a U.S. primary care population (8) and in community populations in three